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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JACKSON, BLANE J

ART UNIT PAPER NUMBER

2685

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,951

Applicant(s)

KLUGE ET AL.

Examiner

Blane J Jackson

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Durec (U.S. Patent 6,144,846 hereinafter Durec '846).

As to claim 1, Durec teaches a mixer comprising:

A multiplier circuit having a first and a second mixer (figures 1-4, first mixer (14A), second mixer (14B),

First and second mixers wherein the two first control signals have a frequency f_1 and two second control signal have a frequency of f_2 (column 1, line 66 to column 2, line 65).

As to claims 2 and 3 Durec '846 teaches the two first and two second control signals are balanced (differential) signals or single ended in figure 1 (column 5, line 59 to column 6, line 4).

3. Claims 4-6, 8, 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Durec (U.S. Patent 6,144,845).

As to claim 4, Durec teaches a mixer for I/Q quadrature signal generation comprising:

A first multiplier circuit having a first and a second mixer (figure 1 to easily identify idea of first multiplier (12), first mixer 14, second mixer 24, figure 4: similar to figure 1 but in quadrature),

A second multiplier circuit having a third and a fourth mixer (figures 1 and 4, third mixer: (34A), fourth mixer (44A), column 7, lines 36-42),

A generator for generating two first and two second control signals for controlling the first and second mixers and two third and two fourth control signals for controlling the third and fourth mixers (figure 4, two first and third control signals: S270 - S90, S180-S0, two second and fourth control signals: 24Sig and 44Sig four phase control signals).

Wherein the two first, two second, two third and two fourth control signals are in each case balanced signals (figure 4: shows balanced or differential LO and RF inputs, column 2, lines 55-65) whereby the two first and two third control signals have a frequency F_1 and the two second and two fourth control signals have a different frequency f_2 (figure 1, Vosc (26) and counter (25), column 5, lines 33-44),

Either of the signals at frequency f_1 or at frequency f_2 is provided in four phases each shifted by 180 degrees (figure 4, column 8, lines 20-58).

As to claim 5, Durec teaches the mixer of claim 4 wherein the first and second multiplier circuits each comprise a Gilbert cell having a plurality of transistors where all transistors are used as switches (figures 2-4 depict Gilbert cell architecture conventionally known to amplify an RF signal and convert from voltage to current by transistor pairs and switched by the mixer core at the rate of the local oscillator, switching transistors: column 4, lines 35-41).

As to claims 6 and 8, Durec teaches the generator comprises a frequency derivation circuit by using frequency division (figure 1, Counter (25) to determine N_{sel} , column 2, lines 35-54).

As to claims 10 and 11, Durec teaches the mixer of claim 8 wherein voltages or currents within the circuit avoid the sum or difference frequency of f_1 and f_2 (a shifted

counter signal to the first and second mixer circuits to cause cancellation of unwanted image signals in the signal Ifout, column 5, line 66 to column 6, line 17).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durec (U.S. Patent 6,144,845) with a view to Durec (U.S. Patent 6,144,846) hereinafter Durec '846.

As to claims 7 and 9, Durec teaches the generator comprises a frequency derivation circuit by using frequency division (figure 1: Vosc (26), Counter (25) to determine Nsel, column 2, lines 35-54) but is silent wherein the frequencies f1 and f2 of the control signals differ from an operation frequency of the generator.

Durec '846 teaches other configurations of a Gilbert based mixer circuit where each of a plurality of mixer stages may receive a local oscillator signal that has been frequency divided and phase shifter from the source local oscillator (figure 3, column 5, lines 4-65). It would have been obvious to one of ordinary skill in the art to modify the simple generator and divisor circuit of Durec with the more selective design of Durec '846 to provide a greater degree of frequency selection.

Durec modified does not teach that the frequency derivation circuit is executed by using frequency multiplication. However, it is well known in the art several schemes to derive a local oscillator frequency for frequency conversion circuits including a voltage controlled oscillator, harmonic amplifiers (multipliers) and, as discussed by Durec, divide by methods. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize in the frequency derivation methods of Durec modified other methods to generate an LO frequency.

Conclusion

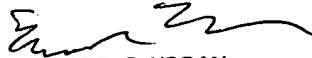
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gilbert (U.S. Patent 5,589,791) discloses a variable gain mixer having improved linearity and lower switching noise.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J Jackson whose telephone number is (703) 305-5291. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJJ


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